

Appln. No. 10/038,612  
Amd. dated October 20, 2003  
Reply to Office Action of April 18, 2003

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-22 (Cancelled)

23 (Currently Amended). ~~The peptide of Claim 68 A~~ peptide capable of modulating the activity of a protein kinase having a structure that includes the twelve subdomains and nine alpha helices that are characteristic of the protein kinase superfamily, consisting of:

a) an  $\alpha$ D region peptide consisting of a sequence of about 20 amino acid residues of the protein kinase Subdomain V and the beginning of Subdomain VI, beginning at the end of the b5 beta sheet and extending through the D helix and the following loop to the beginning of helix E, which amino acids correspond to a continuous stretch of the prototypical PKA-C $\alpha$  in positions 120-139 of the PKA-C $\alpha$ , and which  $\alpha$ D region peptide modulates the activity of the protein kinase;

b) a subsequence peptide consisting of a subsequence of a) consisting of at least five contiguous amino acids thereof, which subsequence peptide modulates the activity of the protein kinase;

c) a modified sequence peptide having a modified sequence of a) or b) in which up to two residues are each substituted by another amino acid residue or amino acid residue analog other than one which is identical to the one being substituted except that a functional group in the side chain is functionalized with a protecting group, which modified sequence peptide modulates the activity of the protein kinase;

d) a protected peptide a), b) or c) in which the N-terminus and/or the C-terminus is protected by a protecting group and/or one or more side chains of the amino acid residues of the peptide of a), b) or c) have been functionalized with a protecting group, which protected peptide modulates the activity of the protein kinase; or

e) a cyclized peptide of a), b), c) or d) which has been cyclized, which cyclized peptide modulates the activity of the protein kinase, wherein the peptide has the sequence of SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:106, SEQ ID NO:107, SEQ ID NO:108, SEQ ID NO:109, SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:112, SEQ ID NO:113, SEQ ID NO:114 SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:117, SEQ ID NO:118, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:121, SEQ ID NO:122, SEQ ID NO:123, SEQ ID NO:124, SEQ ID NO:125, SEQ ID NO:126, SEQ ID NO:127, SEQ ID

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NO:128, SEQ ID NO:129, SEQ ID NO:130, SEQ ID NO:131, SEQ ID  
NO:132, SEQ ID NO:133, SEQ ID NO:134, SEQ ID NO:135, SEQ ID  
NO:136, SEQ ID NO:137, SEQ ID NO:138, SEQ ID NO:139, SEQ ID  
NO:140, SEQ ID NO:141, SEQ ID NO:142, SEQ ID NO:143, SEQ ID  
NO:144, SEQ ID NO:145, SEQ ID NO:146, SEQ ID NO:147, SEQ ID  
NO:148, SEQ ID NO:149, SEQ ID NO:150, SEQ ID NO:151, SEQ ID  
NO:152, SEQ ID NO:153, SEQ ID NO:154, SEQ ID NO:155, SEQ ID  
NO:156, SEQ ID NO:157, SEQ ID NO:158, SEQ ID NO:159, SEQ ID  
NO:160, SEQ ID NO:161, SEQ ID NO:162, SEQ ID NO:163, SEQ ID  
NO:164, SEQ ID NO:165, SEQ ID NO:166, SEQ ID NO:167, SEQ ID  
NO:168, SEQ ID NO:169, or SEQ ID NO:170.

24 (Previously presented). A peptide having the  
sequence of SEQ ID NO:95, SEQ ID NO:96, SEQ ID NO:97, SEQ ID  
NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102,  
SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:106, SEQ  
ID NO:107, SEQ ID NO:108, SEQ ID NO:109, SEQ ID NO:110, SEQ ID  
NO:111, SEQ ID NO:112, SEQ ID NO:113, SEQ ID NO:114, SEQ ID  
NO:115, SEQ ID NO:116, SEQ ID NO:117, SEQ ID NO:118, SEQ ID  
NO:119, SEQ ID NO:120, SEQ ID NO:121, SEQ ID NO:122, SEQ ID  
NO:123, SEQ ID NO:124, SEQ ID NO:125, SEQ ID NO:126, SEQ ID  
NO:127, SEQ ID NO:128, SEQ ID NO:129, SEQ ID NO:130, SEQ ID  
NO:131, SEQ ID NO:132, SEQ ID NO:133, SEQ ID NO:134, SEQ ID  
NO:135, SEQ ID NO:136, SEQ ID NO:137, SEQ ID NO:138, SEQ ID

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NO:139, SEQ ID NO:140, SEQ ID NO:141, SEQ ID NO:142, SEQ ID  
NO:143, SEQ ID NO:144, SEQ ID NO:145, SEQ ID NO:146, SEQ ID  
NO:147, SEQ ID NO:148, SEQ ID NO:149, SEQ ID NO:150, SEQ ID  
NO:151, SEQ ID NO:152, SEQ ID NO:153, SEQ ID NO:154, SEQ ID  
NO:155, SEQ ID NO:156, SEQ ID NO:157, SEQ ID NO:158, SEQ ID  
NO:159, SEQ ID NO:160, SEQ ID NO:161, SEQ ID NO:162, SEQ ID  
NO:163, SEQ ID NO:164, SEQ ID NO:165, SEQ ID NO:166, SEQ ID  
NO:167, SEQ ID NO:168, SEQ ID NO:169, or SEQ ID NO:170, with the  
proviso that any one amino acid residue in the peptide can be  
substituted by another amino acid residue or amino acid residue  
analog.

Claims 25 and 26 (Cancelled).

27 (Currently amended). ~~The peptide of Claim 25~~ A  
peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>23</sub>  
or a subsequence thereof comprising at least five amino acids,  
wherein:

AA<sub>1</sub> is selected from the group consisting of leucine,  
methionine, isoleucine and valine;

AA<sub>2</sub> is selected from the group consisting of aspartic  
acid, threonine, glutamic acid, serine and an aliphatic,  
substituted aliphatic, benzyl, substituted benzyl, aromatic or  
substituted aromatic ester of a glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>5</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>6</sub> is selected from the group consisting of glycine and alanine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of a glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of histidine, arginine and lysine;

AA<sub>11</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>12</sub> is histidine;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of serine, tyrosine, threonine, phenylalanine and tryptophan;

AA<sub>15</sub> is selected from the group consisting of glutamine, asparagine and histidine;

AA<sub>16</sub> is selected from the group consisting of histidine, valine, leucine, methionine and isoleucine;

AA<sub>17</sub> is selected from the group consisting of glycine, aspartic acid, glutamic acid, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of a glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of valine, glutamic acid, asparagine, glutamine, isoleucine, leucine, methionine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of a glutamic acid or aspartic acid;

AA<sub>19</sub> is selected from the group consisting of phenylalanine, aspartic acid, proline, alanine, tryptophan, tyrosine, glutamic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of a glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of asparagine, glycine, glutamine and alanine;

AA<sub>21</sub> is selected from the group consisting of proline, phenylalanine, tryptophan and tyrosine;

AA<sub>22</sub> is selected from the group consisting of glycine and alanine; and

AA<sub>23</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine, wherein the sequence AA<sub>1</sub> through AA<sub>23</sub> or a subsequence thereof corresponds to the sequence or a subsequence of the  $\alpha$ D region of a G protein-coupled receptor kinase selected from the group consisting of SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21 and SEQ ID NO:22, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>23</sub> or the subsequence thereof can vary as set forth ~~in Claim 25~~ above.

28 (Currently amended). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of phenylalanine, histidine, tryptophan and tyrosine;

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AA<sub>4</sub> is selected from the group consisting of leucine, valine, isoleucine and methionine;

AA<sub>5</sub> is selected from the group consisting of histidine, aspartic acid, glutamic acid, and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>6</sub> is selected from the group consisting of glutamine and asparagine;

AA<sub>7</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>8</sub> is selected from the group consisting of leucine, ~~isoleucine~~ isoleucine, methionine ~~[[an]]~~ and valine;

AA<sub>9</sub> is selected from the group consisting of lysine, arginine, threonine and serine;

AA<sub>10</sub> is selected from the group consisting of lysine, threonine, arginine and serine;

AA<sub>11</sub> is selected from the group consisting of phenylalanine, tyrosine and tryptophan;

AA<sub>12</sub> is selected from the group consisting of methionine, leucine, isoleucine and valine;

AA<sub>13</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic,

benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>14</sub> is selected from the group consisting of alanine, lysine, arginine and glycine;

AA<sub>15</sub> is selected from the group consisting of valine, serine, alanine, isoleucine, leucine, methionine and threonine;

AA<sub>16</sub> is selected from the group consisting of alanine, proline and glycine;

AA<sub>17</sub> is selected from the group consisting of leucine, proline, glutamic acid, isoleucine, methionine, valine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of threonine, proline and serine;

AA<sub>19</sub> is selected from the group consisting of glycine and alanine; and

AA<sub>20</sub> is selected from the group consisting of isoleucine, leucine, valine and methionine.

29 (Original). The peptide of Claim 28 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof corresponds to a sequence of the  $\alpha$ D region of a cyclin dependent kinase selected from the group consisting of SEQ ID NO:35, SEQ ID NO:36 and SEQ

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ID NO:37 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary as set forth in Claim 28.

30 (Original). The peptide of Claim 28 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof corresponds to a sequence of the  $\alpha$ D region of a cyclin dependent kinase selected from the group consisting of SEQ ID NO:35, SEQ ID NO:36 and SEQ ID NO:37 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary as set forth in Claim 28.

31 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of threonine, methionine, serine, isoleucine, leucine and valine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of phenylalanine, tyrosine, histidine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of methionine, valine, isoleucine and leucine;

AA<sub>5</sub> is selected from the group consisting of serine, asparagine, cysteine, alanine, glutamic acid, threonine, glutamine, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>6</sub> is selected from the group consisting of lysine, histidine, asparagine, arginine and glutamine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of serine, asparagine, threonine and glutamine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of leucine, valine, isoleucine and methionine;

AA<sub>11</sub> is selected from the group consisting of aspartic acid, asparagine, glutamic acid, glutamine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tyrosine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of lysine and arginine;

AA<sub>15</sub> is selected from the group consisting of glycine, glutamic acid, aspartic acid, asparagine, serine, threonine, glutamine, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>16</sub> is selected from the group consisting of glutamic acid, glycine, proline, aspartic acid, arginine, lysine, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>17</sub> is selected from the group consisting of threonine, serine, aspartic acid, glutamic acid, glycine, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of glycine, arginine, lysine and alanine;

AA<sub>19</sub> is selected from the group consisting of lysine, arginine, glutamine, glycine, serine, isoleucine, alanine, asparagine, threonine, leucine, methionine and valine;

AA<sub>20</sub> is selected from the group consisting of tyrosine, alanine, aspartic acid, lysine, valine, leucine, phenylalanine,

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tryptophan, glutamic acid, arginine, isoleucine, methionine, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid; and

AA<sub>21</sub> is selected from the group consisting of leucine, valine, glutamine, isoleucine, methionine and asparagine.

32 (Original). The peptide of Claim 31 wherein the sequence AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a Src family kinase selected from the group consisting of SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:41, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:44, SEQ ID NO:45 and SEQ ID NO:46 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>21</sub> or the subsequence thereof can vary as set forth in Claim 31.

33 (Original). The peptide of Claim 31 wherein the sequence AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a Src family kinase selected from the group consisting of SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:41, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:44, SEQ ID NO:45 and SEQ ID NO:46 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>21</sub> or the subsequence thereof can vary as set forth in Claim 31.

Claim 34 (Cancelled).

35 (Currently amended). ~~The peptide of Claim 34 A~~  
peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>3</sub>,  
or a subsequence thereof comprising at least seven amino acids,  
wherein:

AA<sub>1</sub> is selected from the group consisting of  
isoleucine, threonine, valine, leucine, methionine and serine;

AA<sub>2</sub> is selected from the group consisting of glutamic  
acid, aspartic acid and an aliphatic, substituted aliphatic,  
benzyl, substituted benzyl, aromatic or substituted aromatic  
ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine,  
phenylalanine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of alanine,  
cysteine, serine, threonine and glycine;

AA<sub>5</sub> is selected from the group consisting of glycine,  
arginine, phenylalanine, lysine, tryptophan and tyrosine;

AA<sub>6</sub> is selected from the group consisting of tyrosine,  
histidine, phenylalanine and tryptophan;

AA<sub>7</sub> is selected from the group consisting of glycine  
and alanine;

AA<sub>8</sub> is selected from the group consisting of  
asparagine, aspartic acid, glutamine, glutamic acid and an

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aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of leucine, valine, serine, isoleucine, methionine and threonine;

AA<sub>11</sub> is selected from the group consisting of aspartic acid, asparagine, threonine, glutamic acid, glutamine, serine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tyrosine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of arginine, histidine and lysine;

AA<sub>15</sub> is selected from the group consisting of lysine, arginine, serine, alanine, glycine and threonine;

AA<sub>16</sub> is selected from the group consisting of serine, asparagine, lysine, threonine, glutamine and arginine;

AA<sub>17</sub> is selected from the group consisting of arginine and lysine;

AA<sub>18</sub> is selected from the group consisting of valine, histidine, aspartic acid, asparagine, isoleucine, leucine, methionine, glutamic acid, glutamine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>19</sub> is selected from the group consisting of leucine, threonine, serine, alanine, glutamic acid, isoleucine, methionine, valine, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of glutamic acid, phenylalanine, aspartic acid, tryptophan, tyrosine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>21</sub> is selected from the group consisting of threonine, leucine, phenylalanine, serine, valine, isoleucine, methionine, tryptophan and tyrosine;

AA<sub>22</sub> is selected from the group consisting of aspartic acid, glutamine, serine, leucine, proline, glutamic acid, asparagine, threonine, isoleucine, methionine, valine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>23</sub> is selected from the group consisting of proline, histidine, asparagine, cysteine, tyrosine, glutamine, phenylalanine, tryptophan, and serine;

AA<sub>24</sub> is selected from the group consisting of alanine, histidine, lysine, arginine and glycine;

AA<sub>25</sub> is selected from the group consisting of phenylalanine, serine, proline, aspartic acid, glutamic acid, tryptophan, tyrosine, threonine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>26</sub> is selected from the group consisting of alanine, aspartic acid, glutamic acid, lysine, arginine, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>27</sub> is selected from the group consisting of arginine, isoleucine, lysine, alanine, serine, glycine, leucine, methionine, valine and threonine;

AA<sub>28</sub> is selected from the group consisting of glutamic acid, alanine, arginine, proline, leucine, aspartic acid, lysine, isoleucine, methionine, valine, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>29</sub> is selected from the group consisting of histidine, asparagine, arginine, lysine, glutamic acid, glutamine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>30</sub> is selected from the group consisting of glycine, serine, proline, lysine, methionine, glutamine, phenylalanine, threonine, arginine, isoleucine, leucine, valine, asparagine, tryptophan, tyrosine and alanine;

AA<sub>31</sub> is selected from the group consisting of threonine, proline, glutamic acid, arginine, serine, aspartic acid, lysine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>32</sub> is selected from the group consisting of serine, alanine, aspartic acid, lysine, arginine, glycine, threonine, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>33</sub> is selected from the group consisting of threonine, glutamic acid, isoleucine, lysine, phenylalanine, serine, aspartic acid, leucine, methionine, valine, arginine, tryptophan, tyrosine and an aliphatic, substituted aliphatic,

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benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>34</sub> is selected from the group consisting of leucine, phenylalanine, glutamic acid, arginine, aspartic acid, isoleucine, methionine, valine, tryptophan, tyrosine, lysine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>35</sub> is selected from the group consisting of tyrosine, glycine, lysine, alanine, phenylalanine, tryptophan and arginine;

AA<sub>36</sub> is selected from the group consisting of serine, leucine, methionine, valine, threonine, and isoleucine;

AA<sub>37</sub> is selected from the group consisting of asparagine, glutamic acid, valine, glycine, glutamine, aspartic acid, isoleucine, leucine, methionine, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>38</sub> is selected from the group consisting of alanine, proline, glutamic acid, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>39</sub> is selected from the group consisting of leucine, alanine, glycine, isoleucine, methionine and valine, wherein the sequence AA<sub>1</sub> through AA<sub>39</sub>, or a subsequence thereof corresponds to

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the sequence of the  $\alpha$ D region of an endothelial growth factor receptor kinase selected from the group consisting of SEQ ID NO:49[[,]] and SEQ ID NO:50, ~~SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, SEQ ID NO:58 and SEQ ID NO:59~~ or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>3</sub>, or the subsequence thereof can vary as set forth ~~in Claim 34~~ above.

36 (Currently amended). ~~The peptide of Claim 34 A~~ peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>3</sub>, or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of isoleucine, threonine, valine, leucine, methionine and serine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of alanine, cysteine, serine, threonine and glycine;

AA<sub>5</sub> is selected from the group consisting of glycine, arginine, phenylalanine, lysine, tryptophan and tyrosine;

AA<sub>6</sub> is selected from the group consisting of tyrosine, histidine, phenylalanine and tryptophan;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of asparagine, aspartic acid, glutamine, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of leucine, valine, serine, isoleucine, methionine and threonine;

AA<sub>11</sub> is selected from the group consisting of aspartic acid, asparagine, threonine, glutamic acid, glutamine, serine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tyrosine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of arginine, histidine and lysine;

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AA<sub>15</sub> is selected from the group consisting of lysine, arginine, serine, alanine, glycine and threonine;

AA<sub>16</sub> is selected from the group consisting of serine, asparagine, lysine, threonine, glutamine and arginine;

AA<sub>17</sub> is selected from the group consisting of arginine and lysine;

AA<sub>18</sub> is selected from the group consisting of valine, histidine, aspartic acid, asparagine, isoleucine, leucine, methionine, glutamic acid, glutamine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>19</sub> is selected from the group consisting of leucine, threonine, serine, alanine, glutamic acid, isoleucine, methionine, valine, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of glutamic acid, phenylalanine, aspartic acid, tryptophan, tyrosine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>21</sub> is selected from the group consisting of threonine, leucine, phenylalanine, serine, valine, isoleucine, methionine, tryptophan and tyrosine;

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AA<sub>22</sub> is selected from the group consisting of aspartic acid, glutamine, serine, leucine, proline, glutamic acid, asparagine, threonine, isoleucine, methionine, valine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>23</sub> is selected from the group consisting of proline, histidine, asparagine, cysteine, tyrosine, glutamine, phenylalanine, tryptophan, and serine;

AA<sub>24</sub> is selected from the group consisting of alanine, histidine, lysine, arginine and glycine;

AA<sub>25</sub> is selected from the group consisting of phenylalanine, serine, proline, aspartic acid, glutamic acid, tryptophan, tyrosine, threonine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>26</sub> is selected from the group consisting of alanine, aspartic acid, glutamic acid, lysine, arginine, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>27</sub> is selected from the group consisting of arginine, isoleucine, lysine, alanine, serine, glycine, leucine, methionine, valine and threonine;

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AA<sub>28</sub> is selected from the group consisting of glutamic acid, alanine, arginine, proline, leucine, aspartic acid, lysine, isoleucine, methionine, valine, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>29</sub> is selected from the group consisting of histidine, asparagine, arginine, lysine, glutamic acid, glutamine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>30</sub> is selected from the group consisting of glycine, serine, proline, lysine, methionine, glutamine, phenylalanine, threonine, arginine, isoleucine, leucine, valine, asparagine, tryptophan, tyrosine and alanine;

AA<sub>31</sub> is selected from the group consisting of threonine, proline, glutamic acid, arginine, serine, aspartic acid, lysine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>32</sub> is selected from the group consisting of serine, alanine, aspartic acid, lysine, arginine, glycine, threonine, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

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AA<sub>33</sub> is selected from the group consisting of threonine, glutamic acid, isoleucine, lysine, phenylalanine, serine, aspartic acid, leucine, methionine, valine, arginine, tryptophan, tyrosine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>34</sub> is selected from the group consisting of leucine, phenylalanine, glutamic acid, arginine, aspartic acid, isoleucine, methionine, valine, tryptophan, tyrosine, lysine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>35</sub> is selected from the group consisting of tyrosine, glycine, lysine, alanine, phenylalanine, tryptophan and arginine;

AA<sub>36</sub> is selected from the group consisting of serine, leucine, methionine, valine, threonine, and isoleucine;

AA<sub>37</sub> is selected from the group consisting of asparagine, glutamic acid, valine, glycine, glutamine, aspartic acid, isoleucine, leucine, methionine, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>38</sub> is selected from the group consisting of alanine, proline, glutamic acid, aspartic acid, glycine and an aliphatic,

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substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>39</sub> is selected from the group consisting of leucine, alanine, glycine, isoleucine, methionine and valine, wherein the sequence AA<sub>1</sub> through AA<sub>39</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of an endothelial growth factor receptor kinase selected from the group consisting of SEQ ID NO:49[[,]] and SEQ ID NO:50, ~~SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:57, SEQ ID NO:58 and SEQ ID NO:59~~ or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>39</sub> or the subsequence thereof can vary as set forth in Claim 34 above.

37 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of valine, isoleucine, leucine and methionine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, cysteine, phenylalanine, tryptophan and serine;

AA<sub>4</sub> is selected from the group consisting of alanine and glycine;

AA<sub>5</sub> is selected from the group consisting of serine, alanine, threonine and glycine;

AA<sub>6</sub> is selected from the group consisting of lysine and arginine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of arginine and lysine;

AA<sub>11</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of glutamine, arginine, asparagine and lysine;

AA<sub>15</sub> is selected from the group consisting of alanine and glycine;

AA<sub>16</sub> is selected from the group consisting of arginine and lysine;

AA<sub>17</sub> is selected from the group consisting of arginine and lysine;

AA<sub>18</sub> is proline;

AA<sub>19</sub> is proline;

AA<sub>20</sub> is selected from the group consisting of glycine and alanine;

AA<sub>21</sub> is selected from the group consisting of leucine, methionine, proline, isoleucine and valine;

AA<sub>22</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>23</sub> is selected from the group consisting of tyrosine, leucine, phenylalanine, tryptophan, isoleucine, methionine and valine;

AA<sub>24</sub> is selected from the group consisting of cysteine, serine and threonine;

AA<sub>25</sub> is selected from the group consisting of tyrosine, phenylalanine, proline and tryptophan;

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AA<sub>26</sub> is selected from the group consisting of asparagine, aspartic acid, glutamine, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>27</sub> is selected from the group consisting of proline, isoleucine, threonine, glycine, leucine, methionine, valine, serine and alanine;

AA<sub>28</sub> is selected from the group consisting of serine, asparagine, cysteine, proline, threonine and glutamine;

AA<sub>29</sub> is selected from the group consisting of histidine, arginine and lysine;

AA<sub>30</sub> is selected from the group consisting of asparagine, valine, proline, serine, glutamine, isoleucine, leucine, methionine and threonine;

AA<sub>31</sub> is selected from the group consisting of proline, serine and threonine;

AA<sub>32</sub> is selected from the group consisting of glutamic acid, glycine, aspartic acid, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>33</sub> is selected from the group consisting of glutamine, proline and asparagine; and

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AA<sub>34</sub> is selected from the group consisting of leucine, methionine, isoleucine and valine.

38 (Currently amended). The peptide of Claim 37, wherein the sequence AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a fibroblast growth factor receptor kinase selected from the group consisting of a subsequence of SEQ ID NO:51, a subsequence of SEQ ID NO:52, a subsequence of SEQ ID NO:53 and a subsequence of SEQ ID NO:54 ~~or a subsequence thereof~~, with the proviso that any two amino acids in the ~~sequence AA<sub>1</sub> through AA<sub>34</sub> or the subsequence thereof~~ can vary as set forth in Claim 37.

39 (Currently amended). The peptide of Claim 37, wherein the sequence AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a fibroblast growth factor receptor kinase selected from the group consisting of a subsequence of SEQ ID NO:51, a subsequence of SEQ ID NO:52, a subsequence of SEQ ID NO:53 and a subsequence of SEQ ID NO:54 ~~or a subsequence thereof~~, with the proviso that any one amino acid in the ~~sequence AA<sub>1</sub> through AA<sub>34</sub> or the subsequence thereof~~ can vary as set forth in Claim 37.

40 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of phenylalanine, tyrosine, and tryptophan;

AA<sub>4</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>5</sub> is proline;

AA<sub>6</sub> is selected from the group consisting of serine, tyrosine, threonine, phenylalanine, tryptophan, leucine and isoleucine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of serine, cysteine and threonine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of lysine and arginine;

AA<sub>11</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of proline, glutamine, and asparagine;

AA<sub>15</sub> is selected from the group consisting of lysine and arginine;

AA<sub>16</sub> is selected from the group consisting of asparagine, histidine and glutamine;

AA<sub>17</sub> is selected from the group consisting of lysine, arginine, serine and threonine;

AA<sub>18</sub> is selected from the group consisting of asparagine, glutamic acid, alanine, glutamine, aspartic acid, glycine, isoleucine, leucine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>19</sub> is selected from the group consisting of lysine and arginine; and

AA<sub>20</sub> is selected from the group consisting of isoleucine, leucine, methionine and valine.

41 (Original). The peptide of Claim 40 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a Tyk/Jak kinase selected from the group consisting of SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75 and SEQ ID NO:76 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary as set forth in Claim 40.

42 (Original). The peptide of Claim 40 wherein the sequence AA<sub>1</sub> through AA<sub>20</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ Dregion of a Tyk/Jak kinase selected from the group consisting of SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75 and SEQ ID NO:76 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>20</sub> or the subsequence thereof can vary as set forth in Claim 40.

43 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>31</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>4</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>5</sub> is selected from the group consisting of alanine and glycine;

AA<sub>6</sub> is histidine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of lysine and arginine;

AA<sub>11</sub> is selected from the group consisting of serine and threonine;

AA<sub>12</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of arginine and lysine;

AA<sub>15</sub> is selected from the group consisting of serine and threonine;

AA<sub>16</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>17</sub> is selected from the group consisting of arginine and lysine;

AA<sub>18</sub> is proline;

AA<sub>19</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of alanine and glycine;

AA<sub>21</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

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AA<sub>22</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>23</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>24</sub> is proline;

AA<sub>25</sub> is selected from the group consisting of glycine and alanine;

AA<sub>26</sub> is selected from the group consisting of arginine and lysine;

AA<sub>27</sub> is proline;

AA<sub>28</sub> is proline;

AA<sub>29</sub> is proline;

AA<sub>30</sub> is selected from the group consisting of threonine and serine; and

AA<sub>31</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine, with the proviso that the peptide is not represented by the sequence MAHGDLKSYLRSLRPEAENNP (SEQ ID NO:171).

44 (Original). The peptide of Claim 43 wherein the sequence AA<sub>1</sub> through AA<sub>31</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of SEQ ID NO:82 or a subsequence thereof, with the proviso that any two amino acids in the

sequence AA<sub>1</sub> through AA<sub>31</sub> or the subsequence thereof can vary as set forth in Claim 43.

45 (Original). The peptide of Claim 43 wherein the sequence AA<sub>1</sub> through AA<sub>31</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of SEQ ID NO:82 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>31</sub> or the subsequence thereof can vary as set forth in Claim 43.

46 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of threonine and serine;

AA<sub>2</sub> is selected from the group consisting of alanine and glycine;

AA<sub>3</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>4</sub> is histidine;

AA<sub>5</sub> is selected from the group consisting of alanine, glutamic acid, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>6</sub> is selected from the group consisting of lysine and arginine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of asparagine, serine, glutamine and threonine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of glutamine, serine and threonine;

AA<sub>11</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of threonine, lysine, serine and arginine;

AA<sub>15</sub> is selected from the group consisting of arginine, alanine, glycine and lysine;

AA<sub>16</sub> is selected from the group consisting of histidine, asparagine and glutamine;

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AA<sub>17</sub> is selected from the group consisting of valine, isoleucine, leucine and methionine; and

AA<sub>18</sub> is selected from the group consisting of isoleucine, valine, leucine and methionine.

47 (Original). The peptide of Claim 46 wherein the sequence AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a TGF $\beta$  receptor kinase selected from the group consisting of SEQ ID NO:83, SEQ ID NO:84 and SEQ ID NO:85 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>18</sub> or the subsequence thereof can vary as set forth in Claim 46.

48 (Original). The peptide of Claim 46 wherein the sequence AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a TGF $\beta$  rceptor kinase selected from the group consisting of SEQ ID NO:83, SEQ ID NO:84 and SEQ ID NO:85 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>18</sub> or the subsequence thereof can vary as set forth in Claim 46.

49 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof comprising at least seven amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of threonine and serine;

AA<sub>2</sub> is selected from the group consisting of histidine, aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>4</sub> is histidine;

AA<sub>5</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>6</sub> is selected from the group consisting of histidine, methionine, asparagine, isoleucine, leucine, valine and glutamine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of serine and threonine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tyrosine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of glutamine, lysine, asparagine and arginine;

AA<sub>15</sub> is selected from the group consisting of arginine, leucine, cysteine, serine, lysine, isoleucine, methionine, valine and threonine;

AA<sub>16</sub> is selected from the group consisting of glutamine, threonine, alanine, tyrosine, asparagine, serine, phenylalanine, tryptophan and glycine;

AA<sub>17</sub> is selected from the group consisting of threonine and serine; and

AA<sub>18</sub> is selected from the group consisting of leucine, valine, isoleucine and methionine.

50 (Original). The peptide of Claim 49 wherein the sequence AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of an activin receptor-like kinase

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selected from the group consisting of SEQ ID NO:86, SEQ ID NO:87, SEQ ID NO:88, SEQ ID NO:89 and SEQ ID NO:90 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>18</sub> or the subsequence thereof can vary as set forth in Claim 49.

51 (Original). The peptide of Claim 49 wherein the sequence AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of an activin receptor-like kinase selected from the group consisting of SEQ ID NO:86, SEQ ID NO:87, SEQ ID NO:88, SEQ ID NO:89 and SEQ ID NO:90 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>18</sub> or the subsequence thereof can vary as set forth in Claim 49.

Claim 52 (Cancelled).

53 (Currently amended). ~~The peptide of Claim 52~~ A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic,

benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>5</sub> is selected from the group consisting of arginine and lysine;

AA<sub>6</sub> is histidine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>11</sub> is selected from the group consisting of arginine and lysine;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of arginine and lysine;

AA<sub>15</sub> is selected from the group consisting of serine, alanine, threonine and glycine;

AA<sub>16</sub> is histidine;

AA<sub>17</sub> is selected from the group consisting of glycine and alanine;

AA<sub>18</sub> is proline;

AA<sub>19</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of alanine and glycine;

AA<sub>21</sub> is selected from the group consisting of lysine, valine, methionine, arginine, isoleucine and leucine;

AA<sub>22</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>23</sub> is selected from the group consisting of leucine, methionine, isoleucine and valine;

AA<sub>24</sub> is selected from the group consisting of alanine, valine, isoleucine, leucine, methionine and glycine;

AA<sub>25</sub> is selected from the group consisting of glycine, glutamic acid, aspartic acid, alanine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>26</sub> is selected from the group consisting of glycine and alanine;

AA<sub>27</sub> is selected from the group consisting of glutamic acid, asparagine, glutamine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>28</sub> is selected from the group consisting of aspartic acid, proline, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>29</sub> is selected from the group consisting of valine, proline, arginine, isoleucine, leucine, methionine and lysine;

AA<sub>30</sub> is selected from the group consisting of alanine, threonine, glutamine, serine, asparagine and glycine;

AA<sub>31</sub> is selected from the group consisting of proline, glutamic acid, alanine, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>32</sub> is selected from the group consisting of proline, glycine and alanine;

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AA<sub>33</sub> is selected from the group consisting of leucine, glutamic acid, isoleucine, methionine, valine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid; and

AA<sub>34</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine, wherein the sequence AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a neurotrophic receptor kinase selected from the group consisting of SEQ ID NO:68[[,]] and SEQ ID NO:69 and ~~SEQ ID NO:70~~ or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>34</sub> or the subsequence thereof can vary as set forth in Claim 52 above.

54 (Currently amended). ~~The peptide of Claim 52 A~~  
peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>34</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>5</sub> is selected from the group consisting of arginine and lysine;

AA<sub>6</sub> is histidine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>11</sub> is selected from the group consisting of arginine and lysine;

AA<sub>12</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

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AA<sub>14</sub> is selected from the group consisting of arginine and lysine;

AA<sub>15</sub> is selected from the group consisting of serine, alanine, threonine and glycine;

AA<sub>16</sub> is histidine;

AA<sub>17</sub> is selected from the group consisting of glycine and alanine;

AA<sub>18</sub> is proline;

AA<sub>19</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>20</sub> is selected from the group consisting of alanine and glycine;

AA<sub>21</sub> is selected from the group consisting of lysine, valine, methionine, arginine, isoleucine and leucine;

AA<sub>22</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>23</sub> is selected from the group consisting of leucine, methionine, isoleucine and valine;

AA<sub>24</sub> is selected from the group consisting of alanine, valine, isoleucine, leucine, methionine and glycine;

AA<sub>25</sub> is selected from the group consisting of glycine, glutamic acid, aspartic acid, alanine and an aliphatic,

substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>26</sub> is selected from the group consisting of glycine and alanine;

AA<sub>27</sub> is selected from the group consisting of glutamic acid, asparagine, glutamine, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>28</sub> is selected from the group consisting of aspartic acid, proline, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>29</sub> is selected from the group consisting of valine, proline, arginine, isoleucine, leucine, methionine and lysine;

AA<sub>30</sub> is selected from the group consisting of alanine, threonine, glutamine, serine, asparagine and glycine;

AA<sub>31</sub> is selected from the group consisting of proline, glutamic acid, alanine, aspartic acid, glycine and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>32</sub> is selected from the group consisting of proline, glycine and alanine;

AA<sub>33</sub> is selected from the group consisting of leucine, glutamic acid, isoleucine, methionine, valine, aspartic acid and

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an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid; and

AA<sub>34</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine, wherein the sequence AA<sub>1</sub> through AA<sub>18</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of a neurotrophic receptor kinase selected from the group consisting of SEQ ID NO:68[[,]] and SEQ ID NO:69 and ~~SEQ ID NO:70~~ or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>31</sub> or the subsequence thereof can vary as set forth in Claim 52 above.

55 (Currently amended). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of threonine and serine;

AA<sub>2</sub> is histidine

AA<sub>3</sub> is selected from the group consisting of tryptophan, phenylalanine and tyrosine;

AA<sub>4</sub> is selected from the group consisting of ~~methionine~~, isoleucine, leucine and methionine;

AA<sub>5</sub> is proline;

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AA<sub>6</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of serine and threonine;

AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>11</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>12</sub> is selected from the group consisting of valine, isoleucine, leucine and methionine;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is histidine;

AA<sub>15</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>16</sub> is selected from the group consisting of glycine and alanine;

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AA<sub>17</sub> is selected from the group consisting of threonine and serine;

AA<sub>18</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>19</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine;

AA<sub>20</sub> is selected from the group consisting of valine, isoleucine, leucine and methionine; and

AA<sub>21</sub> is selected from the group consisting of valine, isoleucine, leucine and methionine.

56 (Original). The peptide of Claim 55 wherein the sequence AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of SEQ ID NO:93 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>21</sub> or the subsequence thereof can vary as set forth in Claim 55.

57 (Original). The peptide of Claim 55 wherein the sequence AA<sub>1</sub> through AA<sub>21</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of SEQ ID NO:93 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>21</sub> or the subsequence thereof can vary as set forth in Claim 55.

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58 (Original). A peptide consisting of a sequence of amino acids AA<sub>1</sub> through AA<sub>22</sub> or a subsequence thereof comprising at least five amino acids, wherein:

AA<sub>1</sub> is selected from the group consisting of methionine, isoleucine, leucine and valine;

AA<sub>2</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>3</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan;

AA<sub>4</sub> is selected from the group consisting of cysteine and serine;

AA<sub>5</sub> is selected from the group consisting of serine, glutamine, threonine and asparagine;

AA<sub>6</sub> is selected from the group consisting of glycine and alanine;

AA<sub>7</sub> is selected from the group consisting of glycine and alanine;

AA<sub>8</sub> is selected from the group consisting of aspartic acid, glutamic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

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AA<sub>9</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>10</sub> is selected from the group consisting of arginine and lysine;

AA<sub>11</sub> is selected from the group consisting of lysine and asparagine;

AA<sub>12</sub> is selected from the group consisting of leucine, tyrosine, isoleucine, methionine, valine, phenylalanine and tryptophan;

AA<sub>13</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine;

AA<sub>14</sub> is selected from the group consisting of asparagine and glutamine;

AA<sub>15</sub> is selected from the group consisting of lysine, glutamine, arginine and asparagine;

AA<sub>16</sub> is selected from the group consisting of proline, phenylalanine, tryptophan and tyrosine;

AA<sub>17</sub> is selected from the group consisting of glutamic acid, aspartic acid and an aliphatic, substituted aliphatic, benzyl, substituted benzyl, aromatic or substituted aromatic ester of glutamic acid or aspartic acid;

AA<sub>18</sub> is selected from the group consisting of asparagine and glutamine;

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AA<sub>19</sub> is selected from the group consisting of cysteine and serine;

AA<sub>20</sub> is selected from the group consisting of cysteine and serine;

AA<sub>21</sub> is selected from the group consisting of glycine and alanine; and

AA<sub>22</sub> is selected from the group consisting of leucine, isoleucine, methionine and valine.

59 (Original). The peptide of Claim 58 wherein the sequence AA<sub>1</sub> through AA<sub>22</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of an I-kappa B kinase selected from the group consisting of SEQ ID NO:79 and SEQ ID NO:80 or a subsequence thereof, with the proviso that any two amino acids in the sequence AA<sub>1</sub> through AA<sub>22</sub> or the subsequence thereof can vary as set forth in Claim 58.

60 (Original). The peptide of Claim 58 wherein the sequence AA<sub>1</sub> through AA<sub>22</sub> or a subsequence thereof corresponds to the sequence of the  $\alpha$ D region of an I-kappa B kinase selected from the group consisting of SEQ ID NO:79 and SEQ ID NO:80 or a subsequence thereof, with the proviso that any one amino acid in the sequence AA<sub>1</sub> through AA<sub>22</sub> or the subsequence thereof can vary as set forth in Claim 58.

Claims 61-86 (Cancelled).